PIONEER

Service Manual

CIRCUIT DESCRIPTIONS

The photo shows the model TX-940.

ORDER NO.
ARP-353-0

STEREO TUNER

TX-540 F-50

FM/AM DIGITAL SYNTHESIZED TUNER

TX-940 F-70

- This service manual is made based on the KU, KC types. It can be applied to other types except for minor points.

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1. TX-540 AND F-50 CIRCUIT DESCRIPTIONS

1.1 IC OUTLINE

TA7640AP Pin Functions

Pin	Standard voltage (V)		Pin name	I/O	Function and operation
	FM	AM			
1	0	1.5	AM MIX IN	Input	AM mixer input
2	0	1.5	AM MIX BYPASS	Input	Connection to AM mixer bias capacitor. Connecting this pin to ground inhibits mixer operation, and switches the pin no.9 output to an FM detector output.
3	2.3	2.3	AM OSC		Connection to AM local oscillator tuning circuit.
4	2.3	2.3	Reg	Output	Constant voltage (2.3V) ouput pin.
5	0.9	1.0	AM IF OUT	Input/output	AM IF amplifier output and AM detector input.
6	0.9	1.0	Meter OUT	Input/output	Signal meter output and signal indicator driver input.
7	–	–	LED	Output	Signal indicator output. L level active.
8	0	0	GND		GND.
9	1.5	1.4	DET OUT	Output	Output pin: FM output when pin no.2 is 0V. AM output when pin no.2 is 1.5V.
10	6.3	6.3	Vcc		Power supply voltage pin.
11	6.3	6.3	FM DET		Connection to FM quadrature detector tuning circuit.
12	1.5	1.5	AM IF BYPASS		Connection to AM IF amplifier bypass capacitor.
13	1.5	1.5	AM IF IN	Input	AM IF amplifier input pin.
14	1.5	1.5	FM IF BYPASS		Connection to FM IF amplifier bypass capacitor.
15	1.5	1.5	FM IF IN	Input	FM IF amplifier input pin.
16	6.3	6.3	AM MIX OUT	Output	AM mixer output pin.

μPC1235C Pin Functions

Pin	Pin name	I/O	Function and operation
1	Vcc		Power supply voltage pin.
2	PRE AMP IN	Input	Preamplifier input pin.
3	PRE AMP OUT	Output	Preamplifier output pin.
4	POST AMP BIAS (Lch)	Input	Left channel post amplifier bias pin and NF input pin.
5	POST AMP BIAS (Rch)		Right channel post amplifier bias pin and NF input pin.
6	Rch OUT	Output	Right channel post amplifier output pin.
7	Lch OUT		Left channel post amplifier output pin.
8	GND		GND
9	ST IND and 19kHz	Output	Stereo indicator output pin and 19kHz check output pin.
10	PILOT FILTER		Connection to pilot detector circuit L.P.F.
11	PILOT FILTER		
12	PILOT IN	Input	Pilot signal input pin.
13	LOOP FILTER		Connection to PLL L.P.F.
14	LOOP FILTER		
15	VCO CR		Connection to VCO capacitance/resistance.
16	AUTO/MONO	Input	Up to 1.4V : Stereo operation. Between 1.6 and 5V : VCO generation in mono mode. Above 7V : VCO generation stopped in mono mode.

BA695 Pin Functions

Pin	Pin name	I/O	Function and operation	
1	REF	Input	FM S-curve center voltage input pin. Connected to ground during AM mode.	
2	SC IN	Input	FM S-curve input pin.	
3	S IN	Input	Signal meter level input pin.	
4	CR		Connection to capacitance/resistance for setting the L1/L3 output blinking frequency. Connect to ground if L1/L3 output blinking not required.	
5	GND		GND.	
6	L 3	Output	S-curve negative region indicator output. This output appears if the output from pin no.3 exceeds 0.5V and the voltage at pin no.2 is at least 90mV less than the voltage at pin no.1. If pin no.1 is connected to ground, however, there is no output. If resistance/capacitance is connected to pin no.4, the output blinks on and off at the frequency set by that circuit. See Figure 1-1.	L Level Active
7	L 2	Output	S-curve central region indicator and AM mode signal indicator output. This output appears if the output from pin no.3 exceeds 0.5V and the voltage at pin no.2 is at least 90mV less than the voltage at pin no.1. The output is also obtained if an input of at least 0.5V is applied to pin no.3 when pin no.1 is grounded. See Figures 1-1 and 1-2.	
8	L 1	Output	S-curve positive region indicator output. This output appears when the output from pin no.3 is at least 0.5V, and the voltage at pin no.2 is at least 90mV greater than the voltage at pin no.1. There is no output, however, if pin no.1 is connected to ground. If resistance/capacitance is connected to pin no.4, the output blinks on and off at the frequency set by that circuit. See Figure 1-1.	
9	Vcc		Positive power supply voltage pin.	

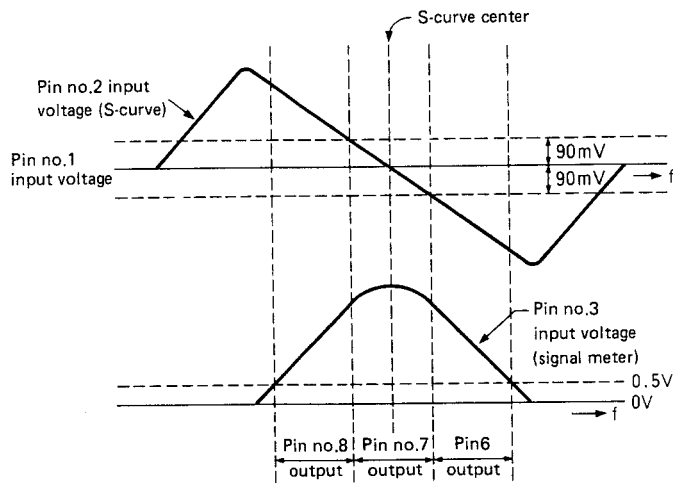


Fig. 1-1 FM mode operation

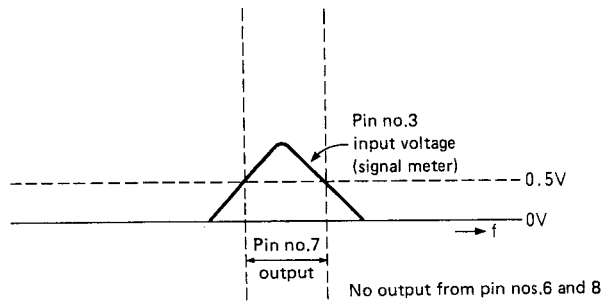
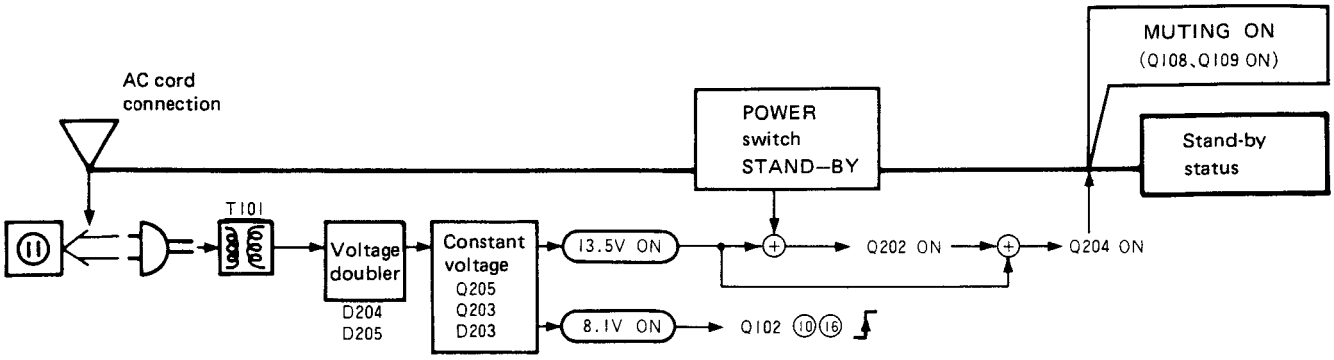


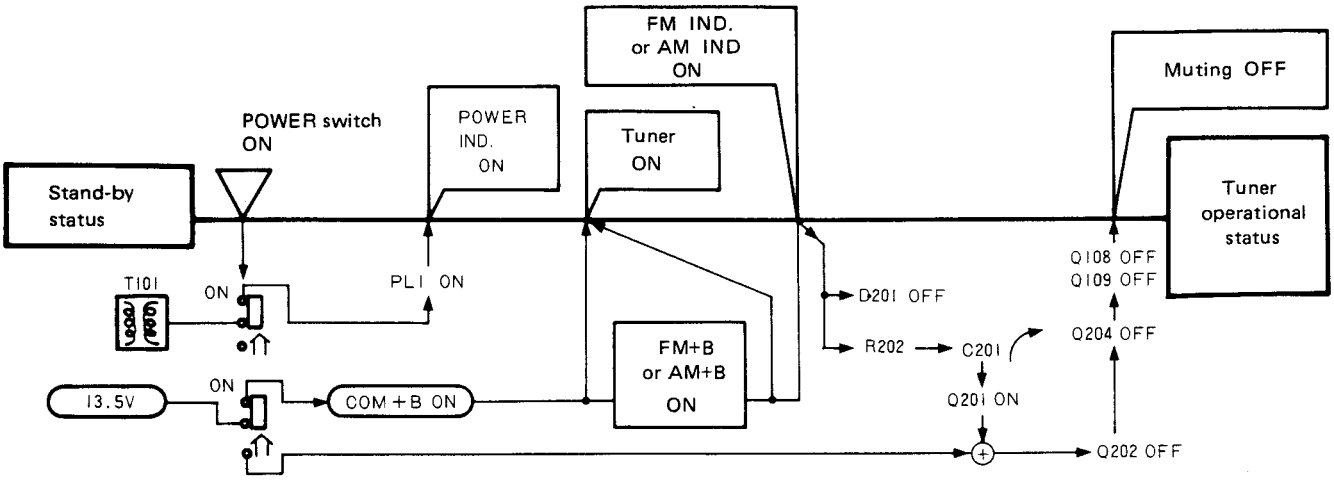
Fig. 1-2 AM mode operation

1.2 OPERATION FLOWCHARTS (See block diagram on page 8)

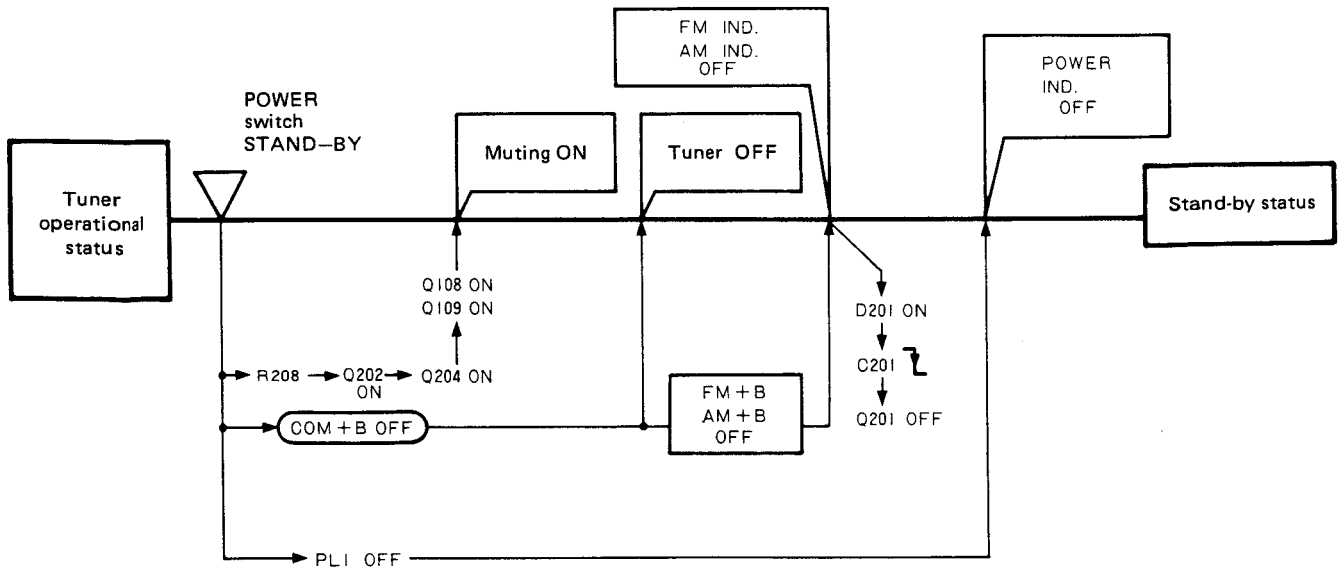
AC Cord Connection



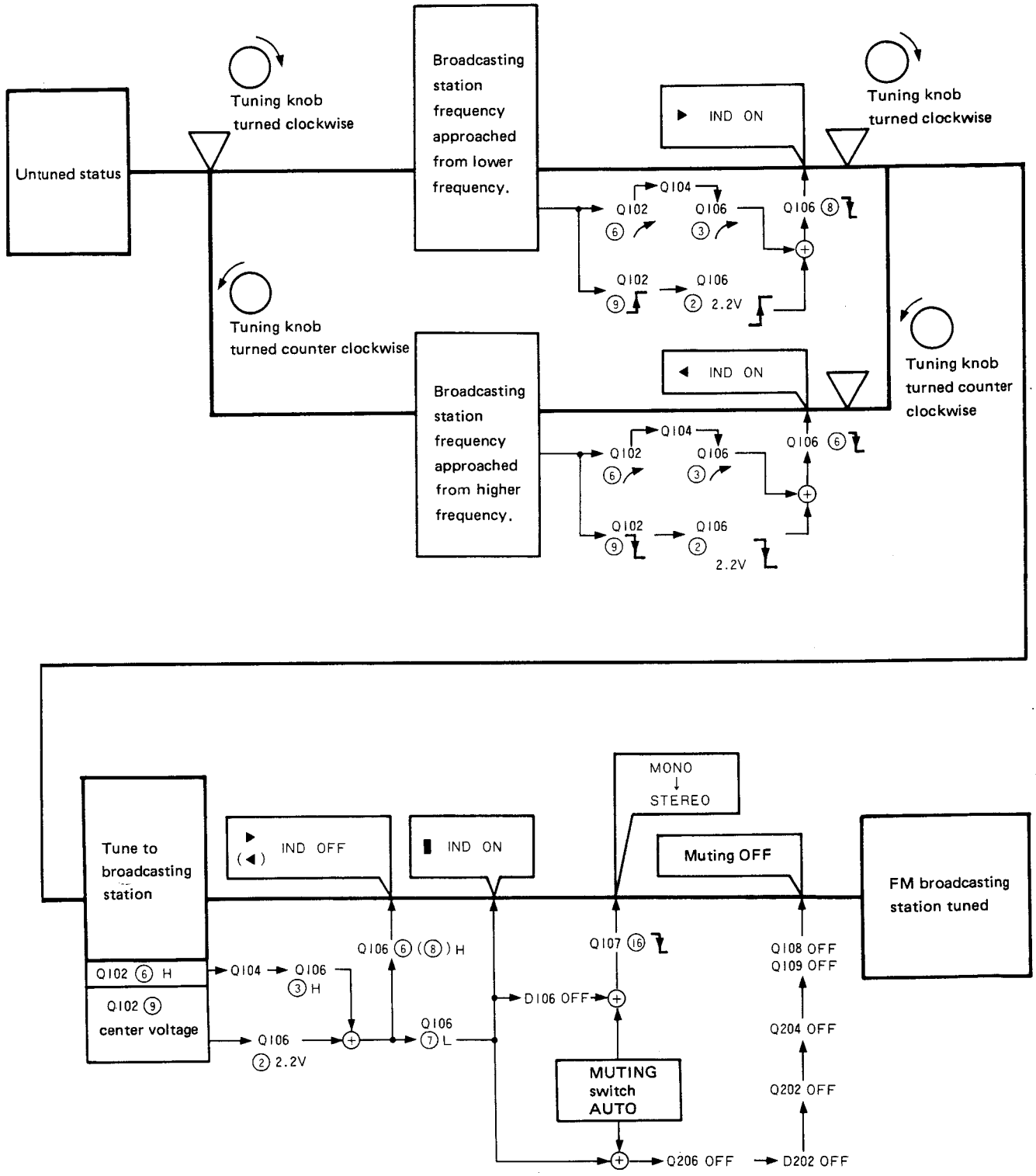
POWER STAND–BY → ON



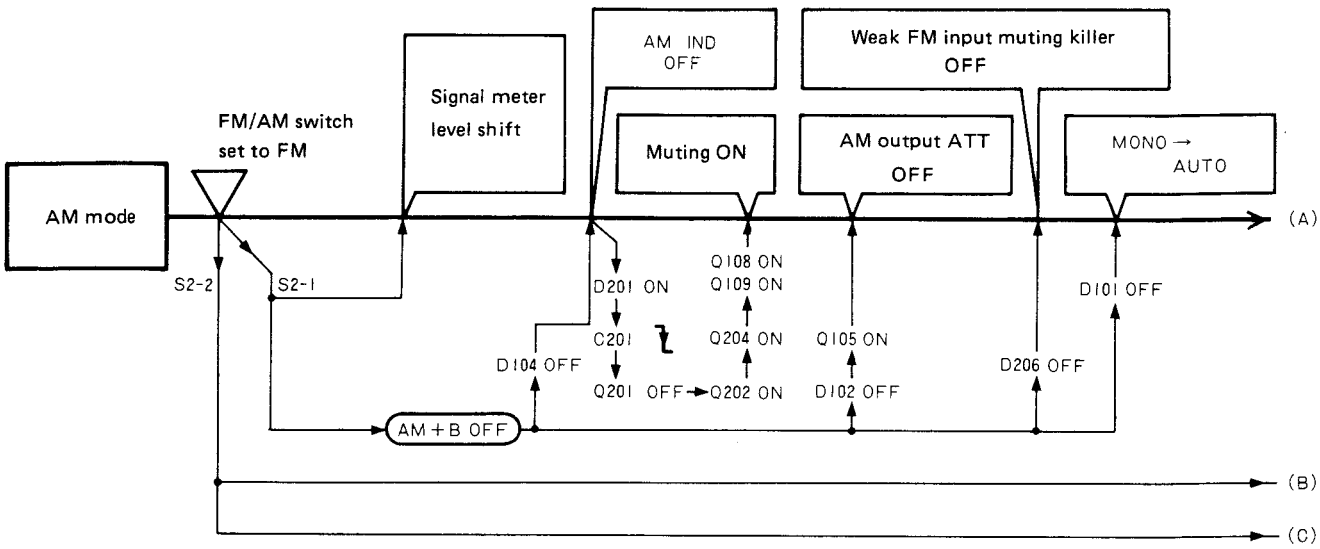
POWER ON → STAND–BY



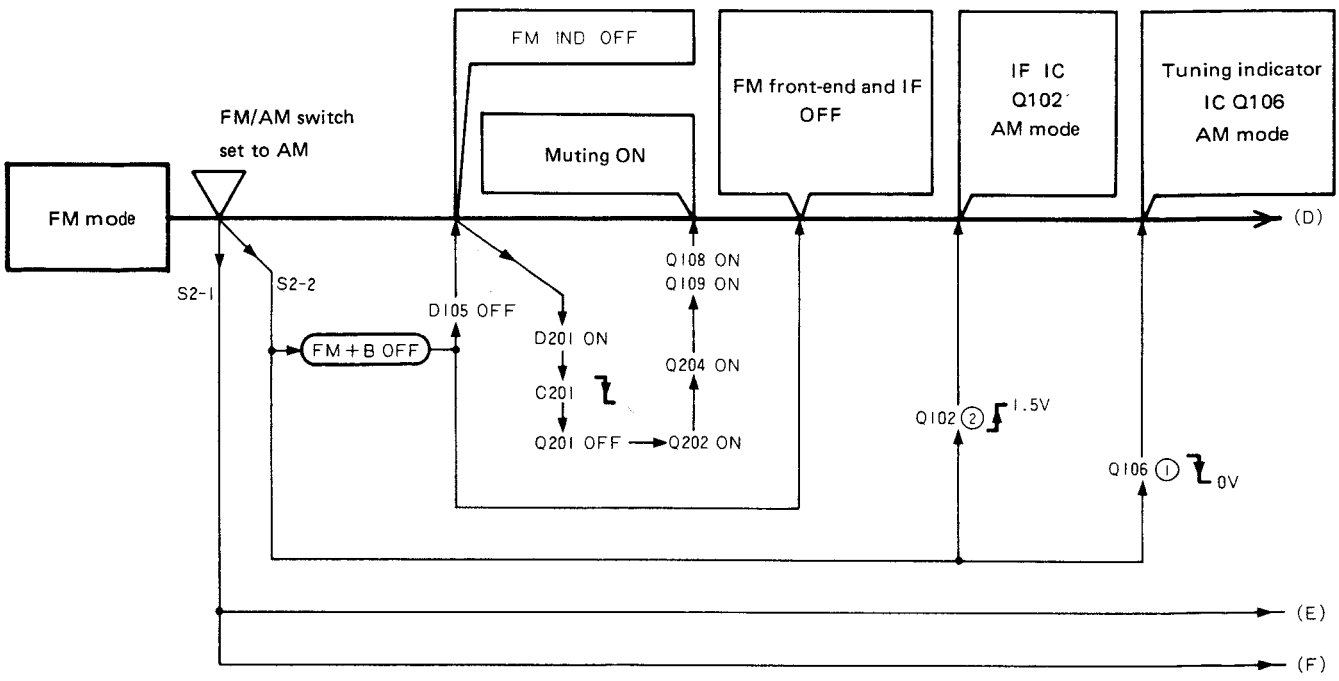
FM Tuning Operation

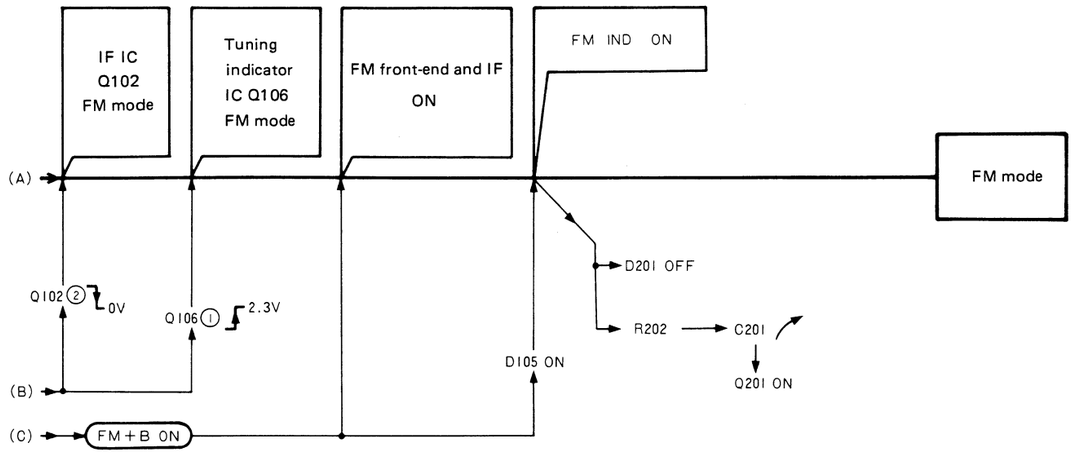


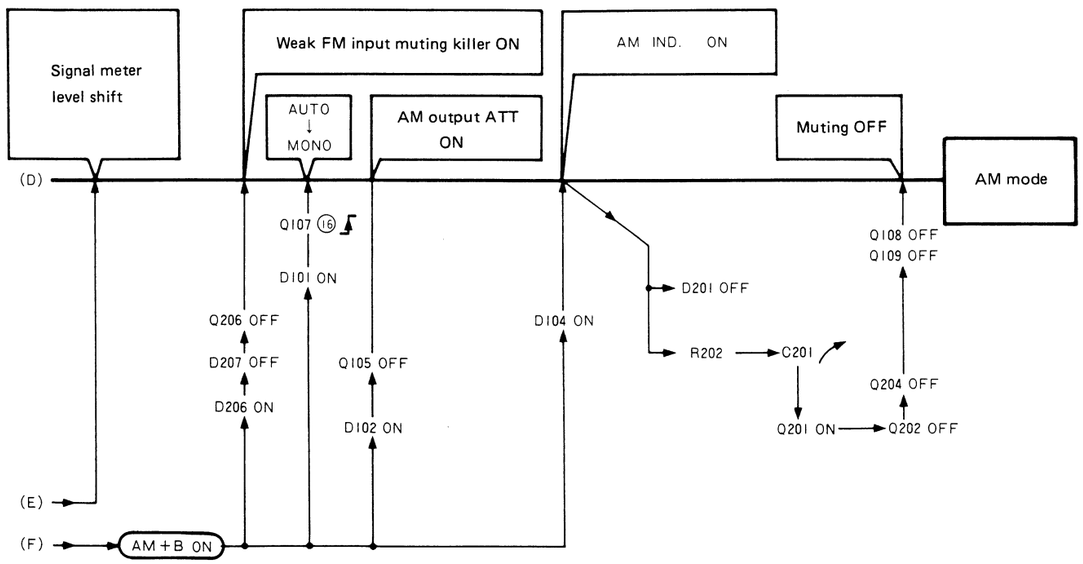
AM → FM


AM mode
FM/AM switch
set to FM
Signal meter
level shift
AM IND
OFF
Muting ON
Weak FM input muting killer
OFF
AM output ATT
OFF
MONO →
AUTO
(A)
S2-2
S2-1
D201 ON
C201
Q201 OFF
Q202 ON
Q108 ON
Q109 ON
Q204 ON
D104 OFF
Q105 ON
D102 OFF
D206 OFF
D101 OFF
AM+B OFF
(B)
(C)

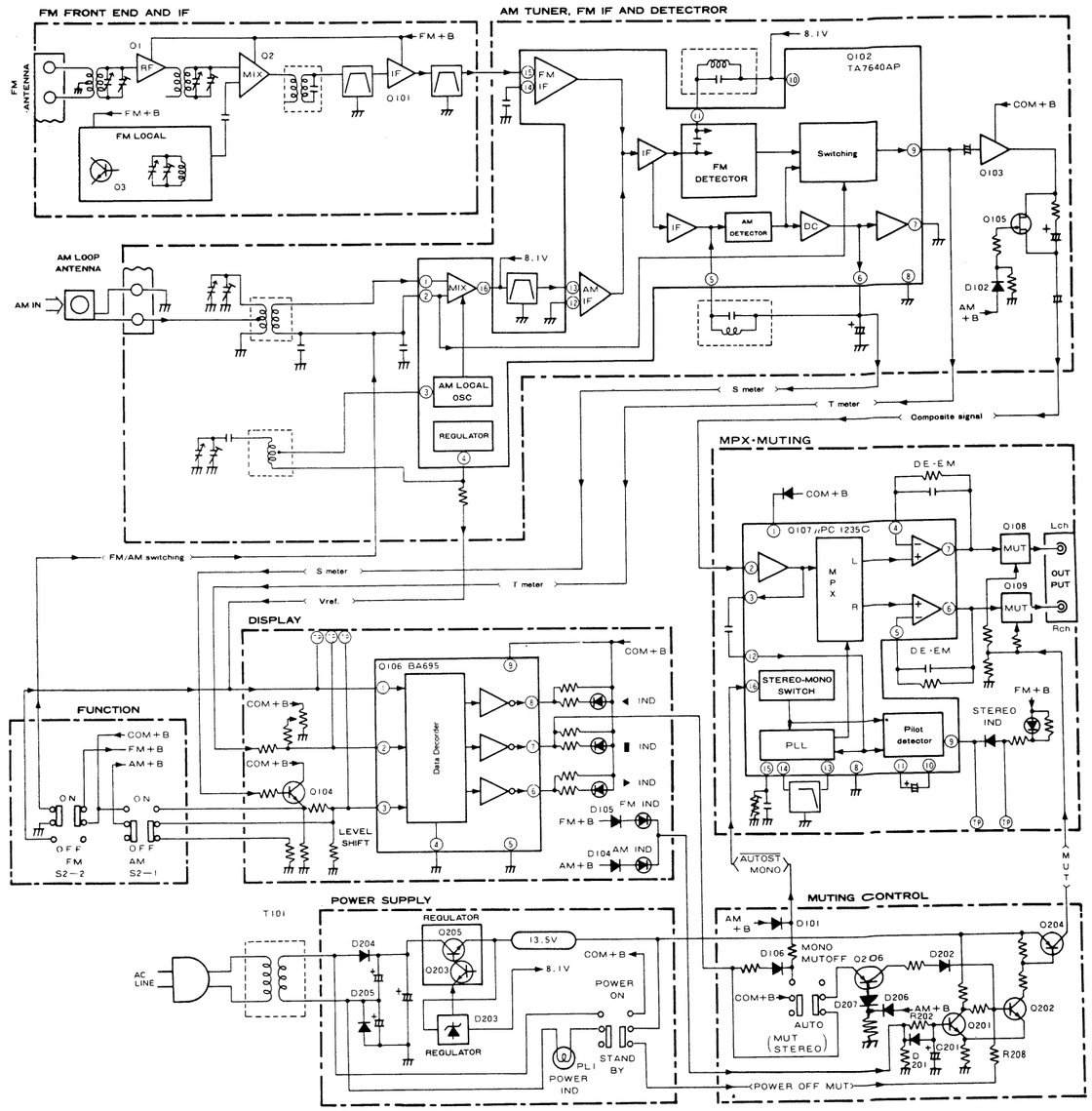
FM → AM


FM mode
FM/AM switch
set to AM
FM IND OFF
Muting ON
FM front-end and IF
OFF
IF IC
Q102
AM mode
Tuning indicator
IC Q106
AM mode
(D)
S2-1
S2-2
D105 OFF
FM+B OFF
D201 ON
C201
Q201 OFF
Q202 ON
Q108 ON
Q109 ON
Q204 ON
Q102 ② 1.5V
Q106 ① 0V
(E)
(F)





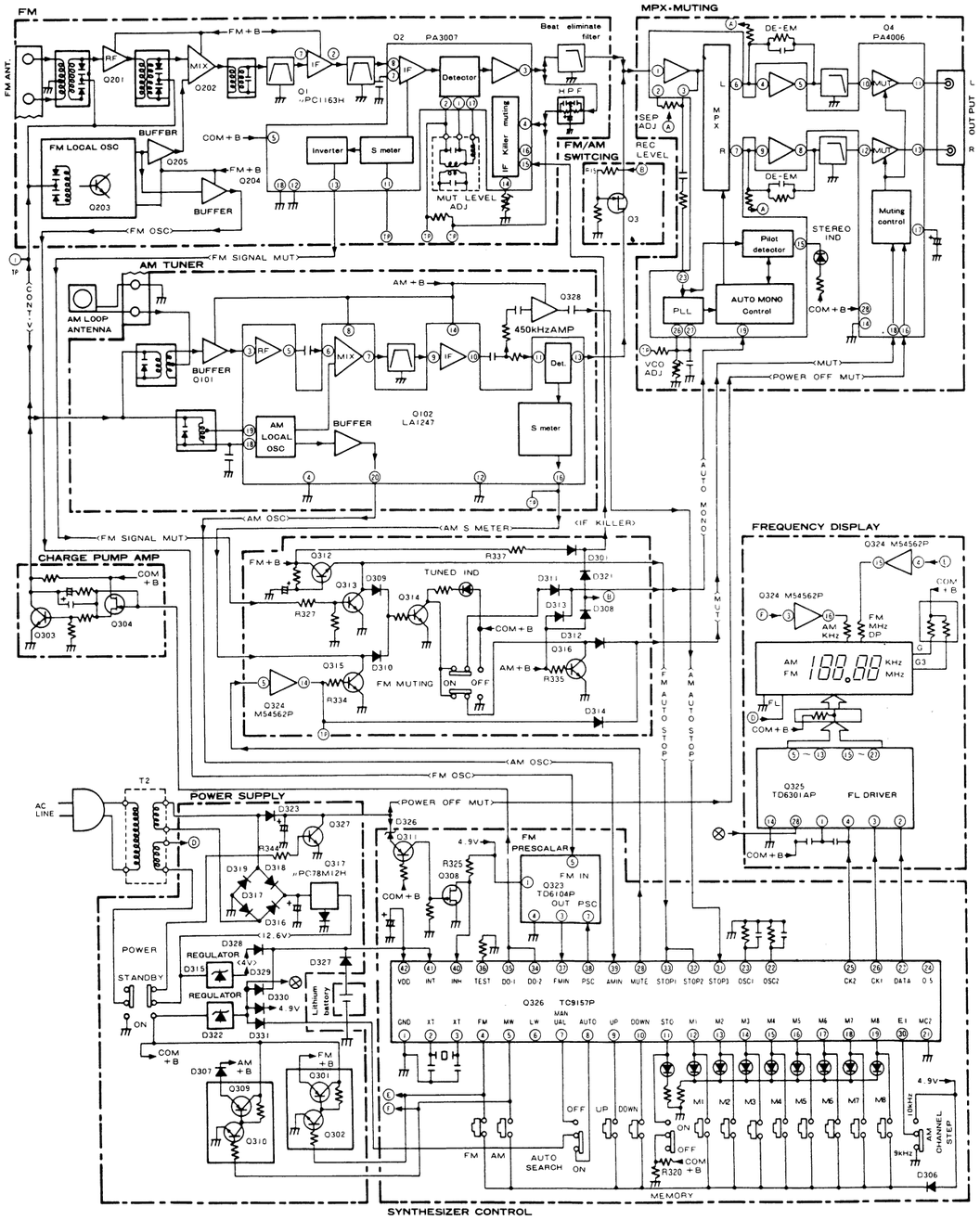
1.3 BLOCK DIAGRAM FOR TX-540 AND F-50



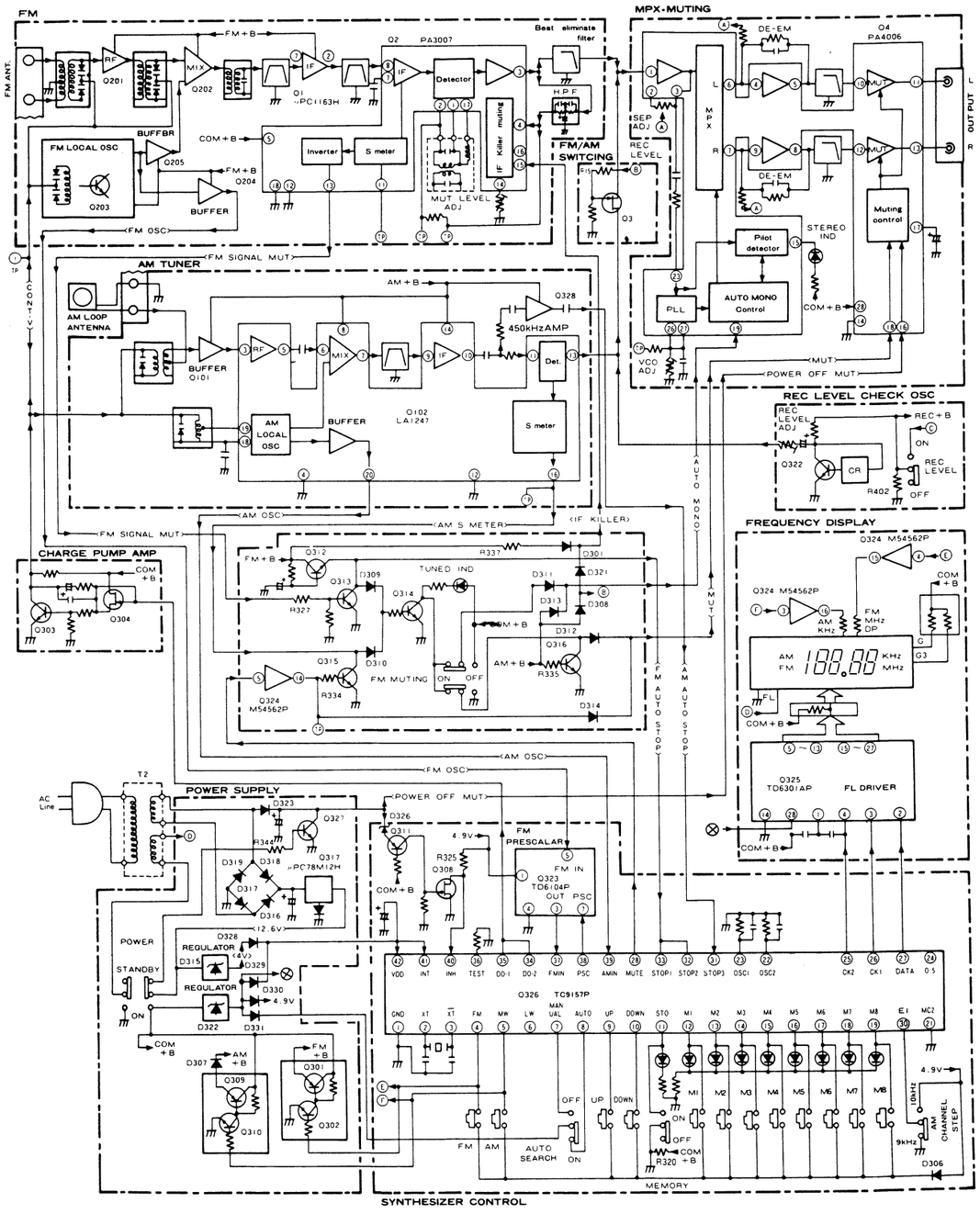
2. TX-940 AND F-70 CIRCUIT DESCRIPTION

2.1 BLOCK DIAGRAM

TX-940

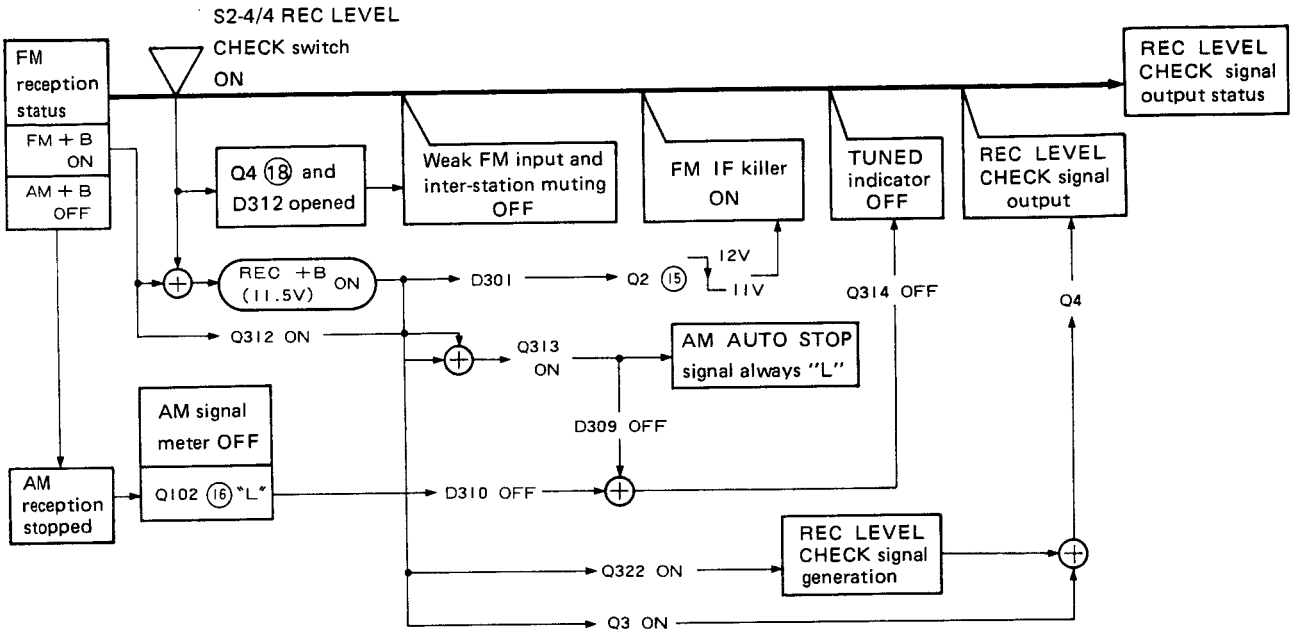


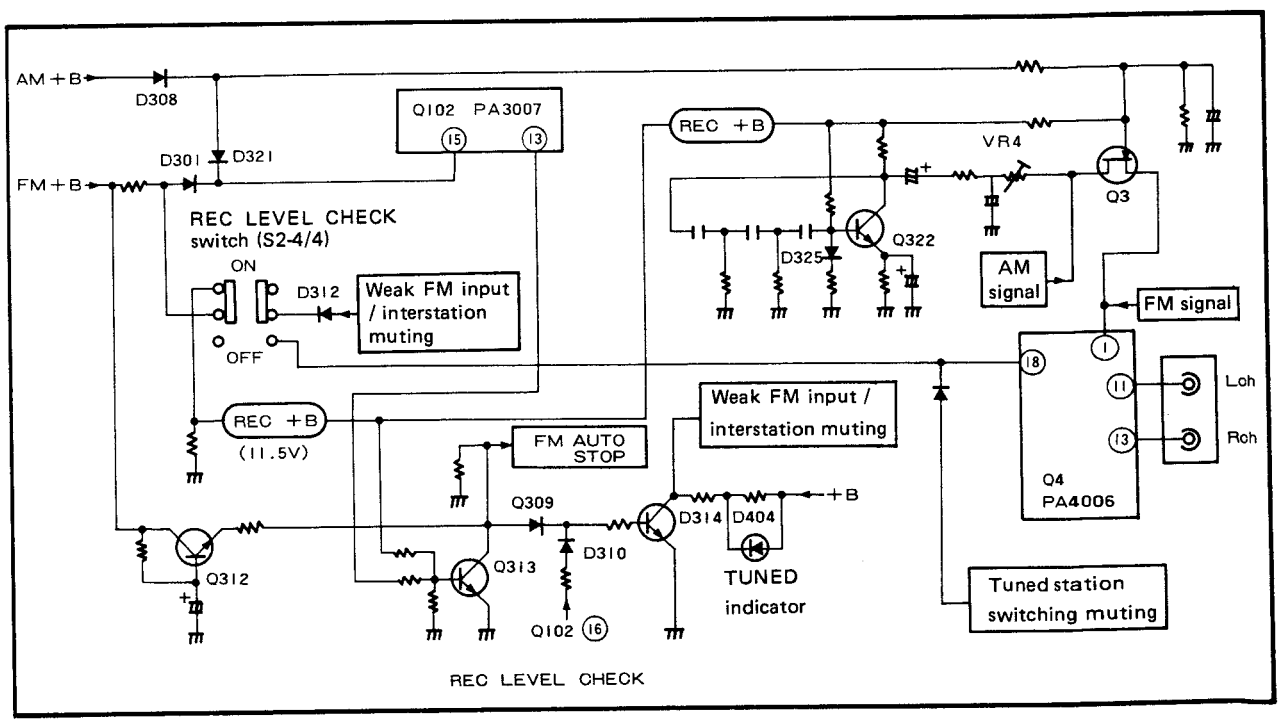
F-70



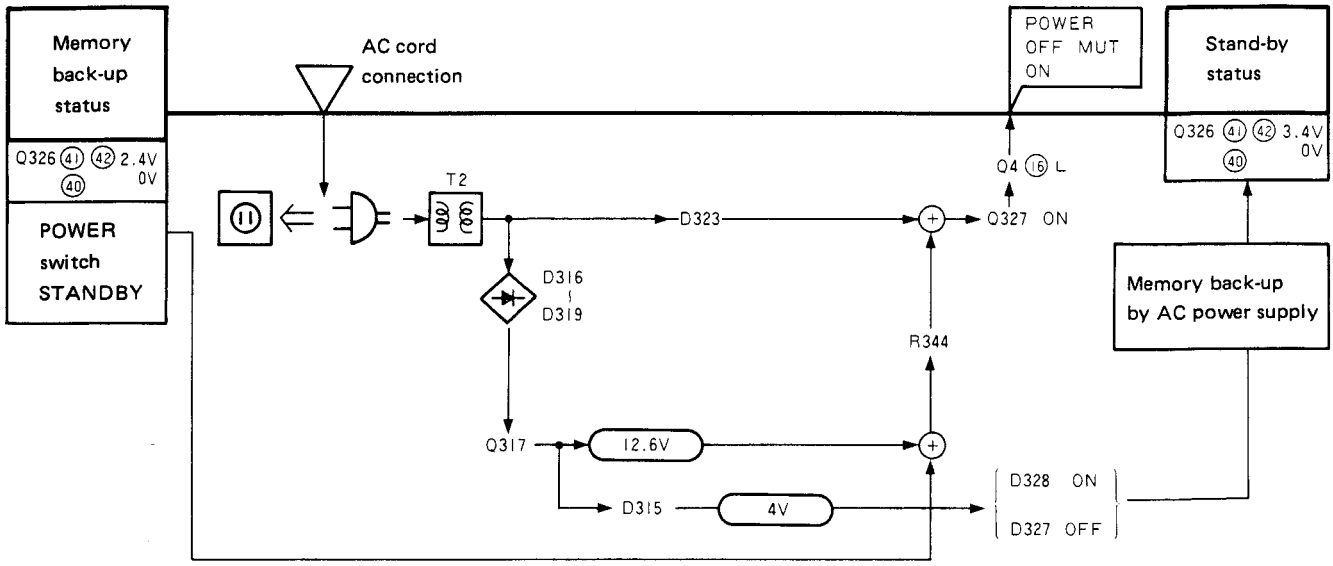
2.2 OPERATION FLOWCHARTS (See block diagram on pages 9 and 10)

FM→ REC LEVEL CHECK Switch ON (F-70 only)

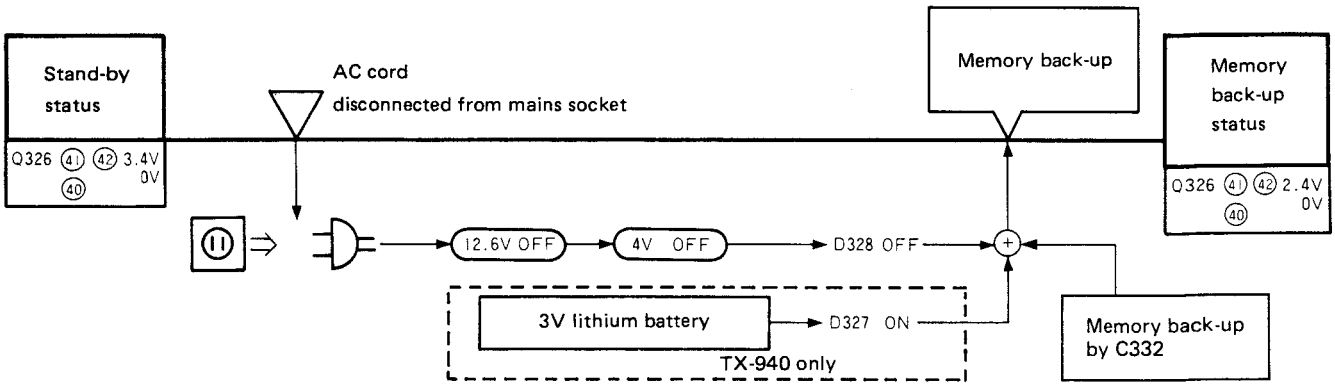




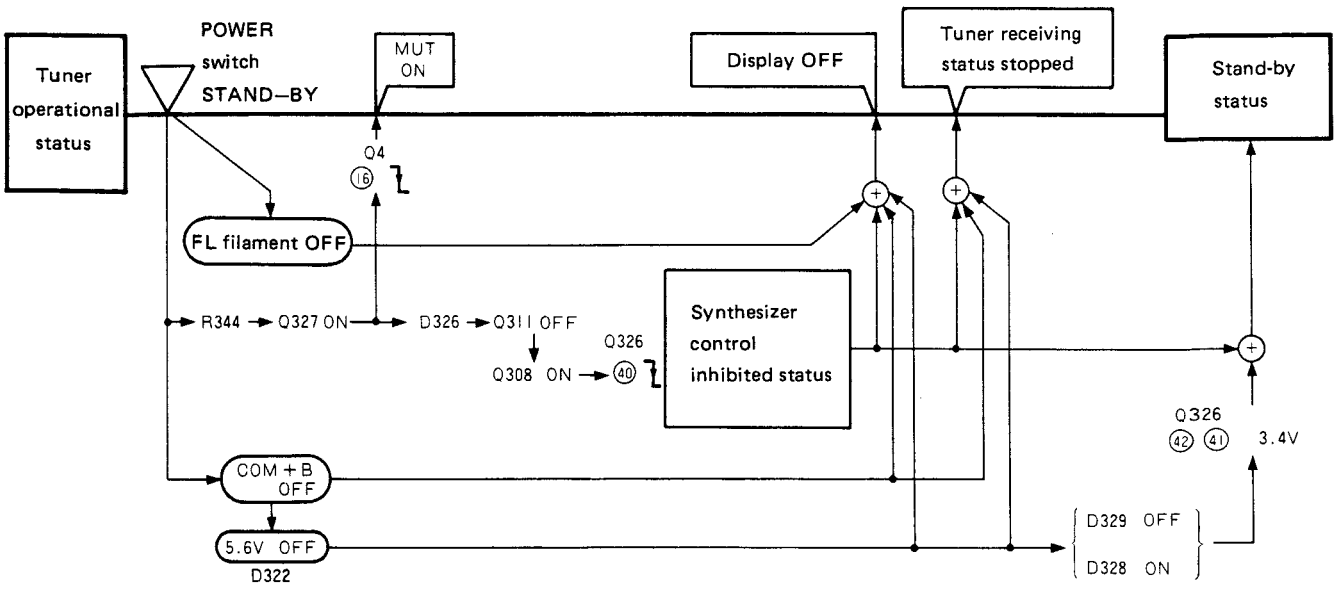
AC Cord Connection



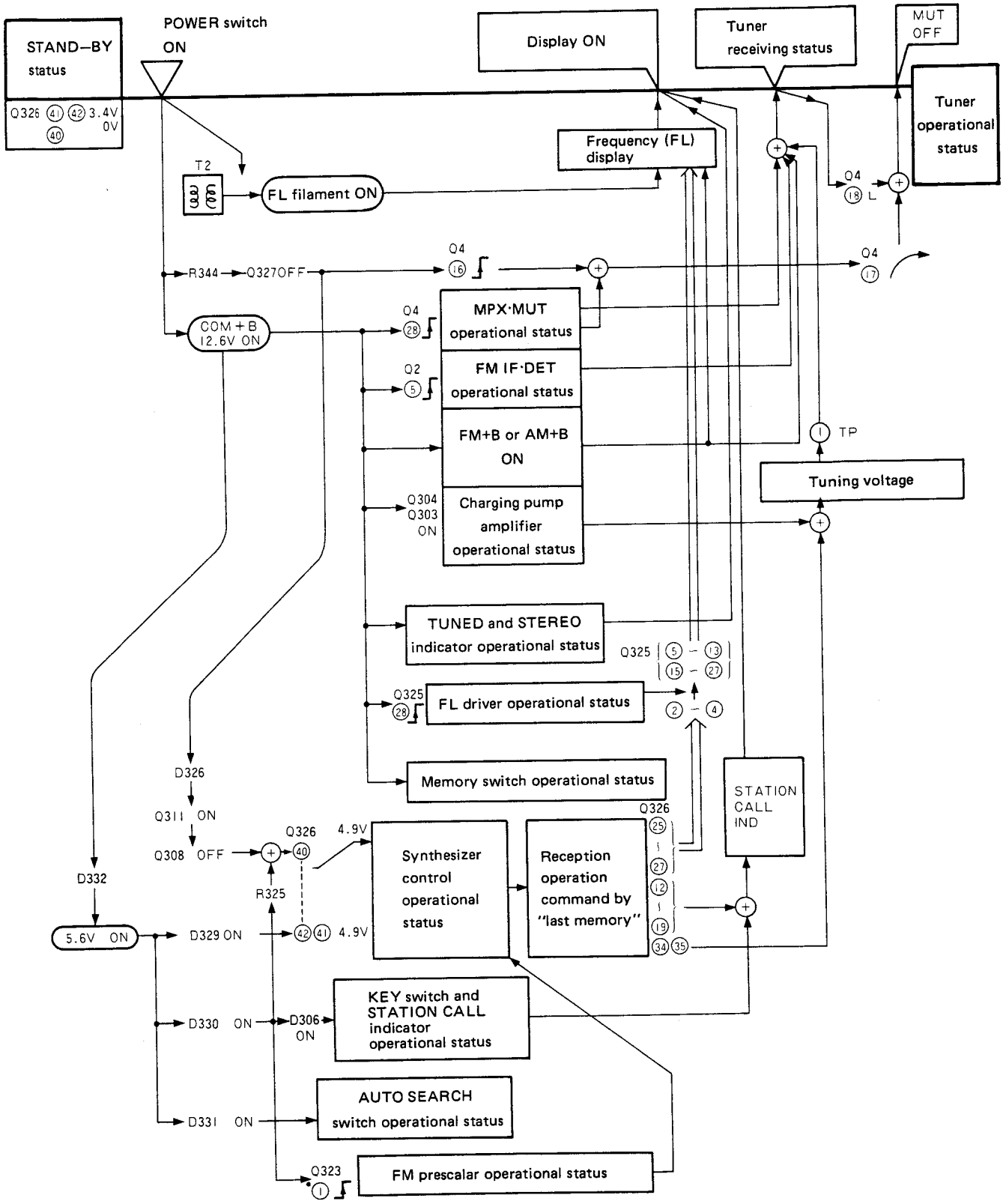
AC Cord Disconnected



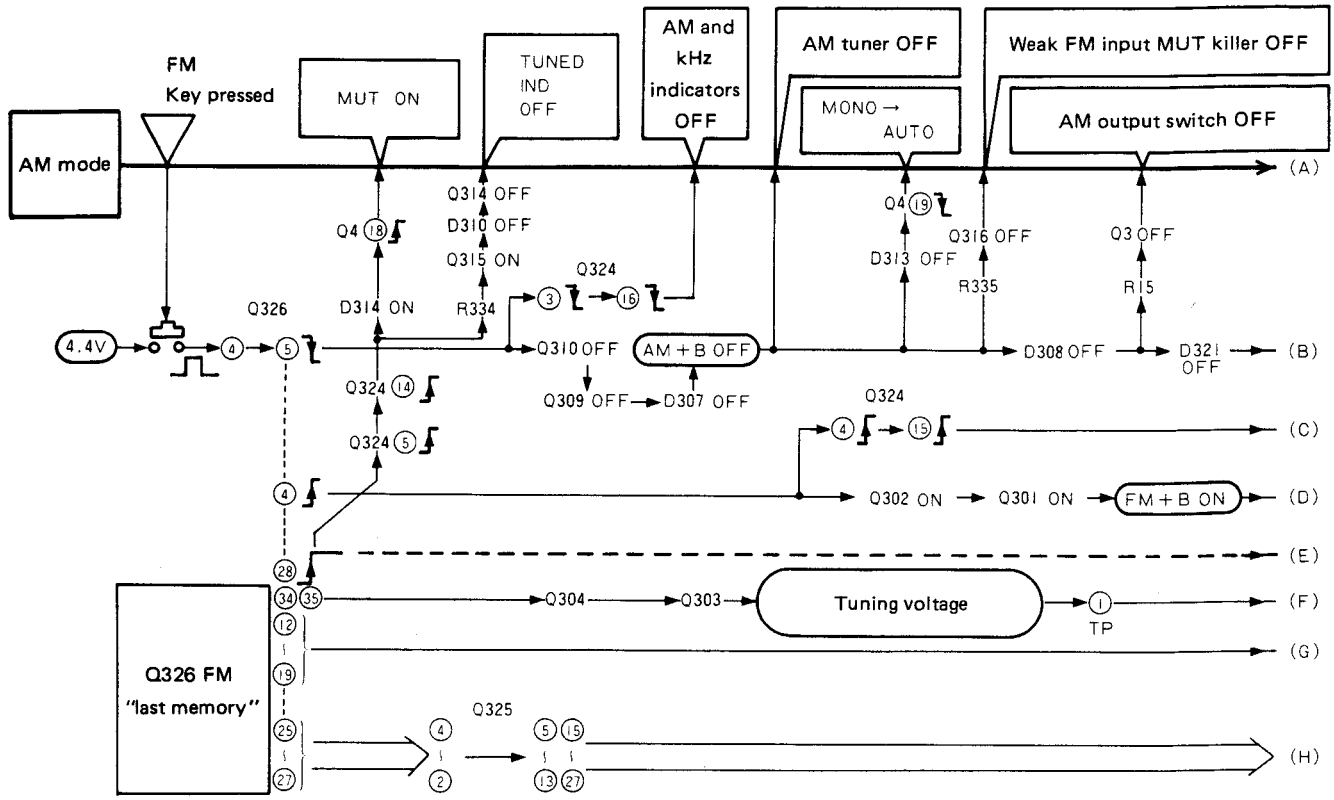
POWER ON → STAND–BY



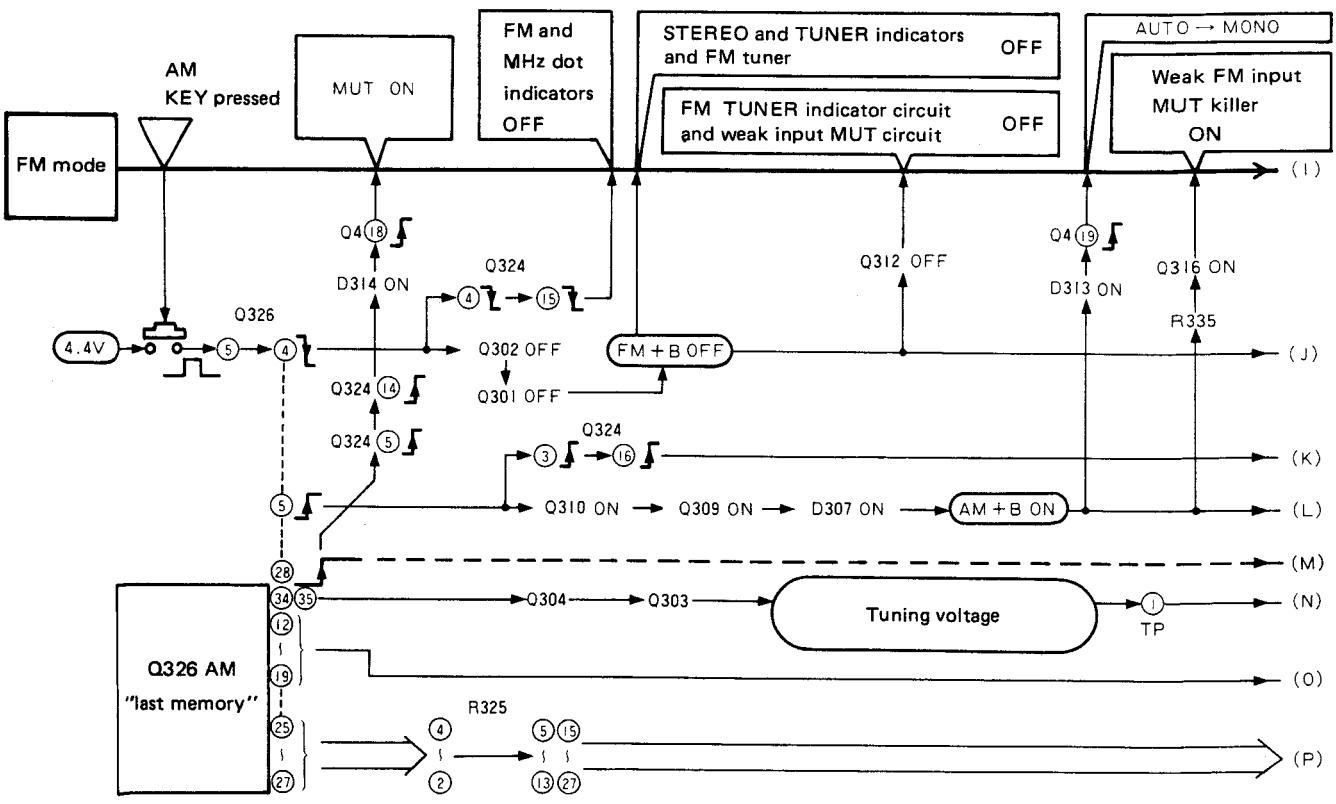
POWER STAND–BY → ON

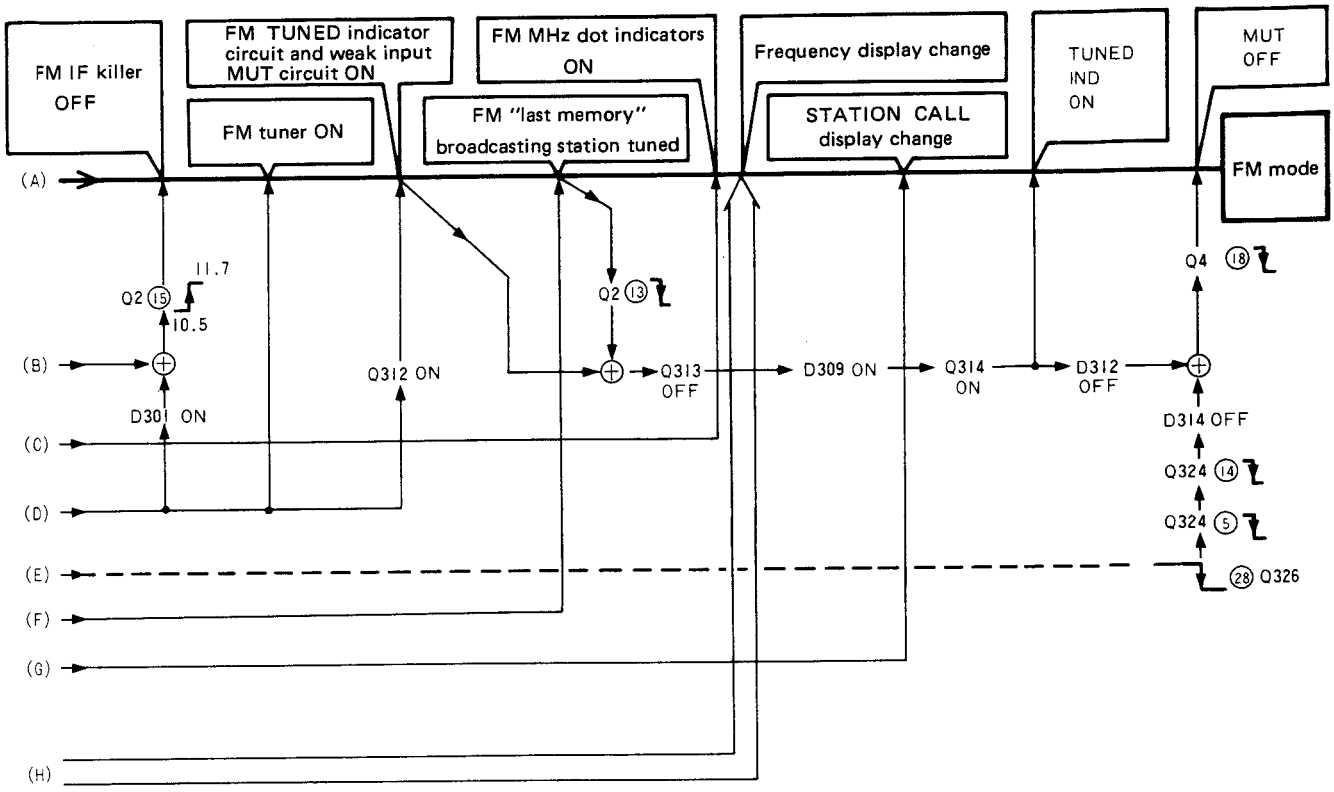


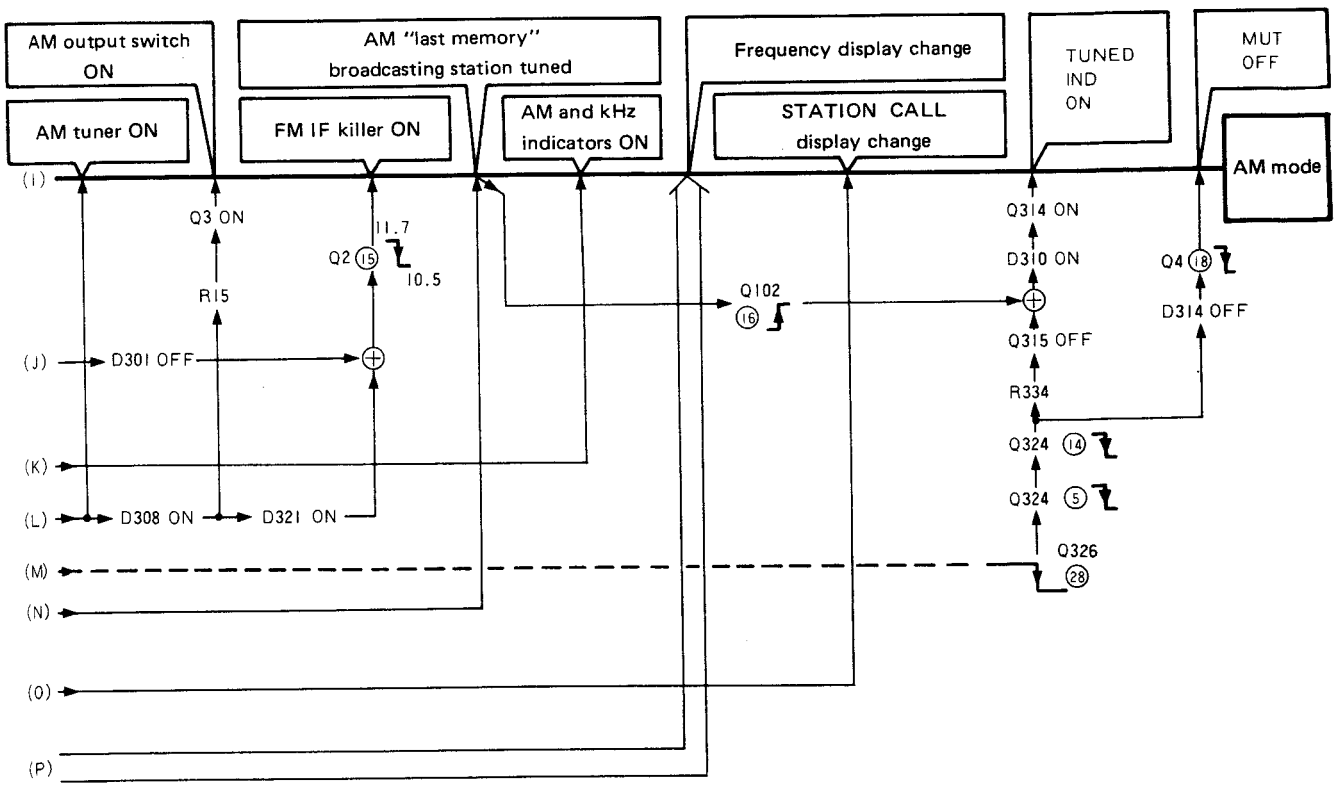
AM → FM


FM
Key pressed
MUT ON
TUNED
IND
OFF
AM and
kHz
indicators
OFF
AM tuner OFF
MONO →
AUTO
Weak FM input MUT killer OFF
AM output switch OFF
AM mode
(A)
Q4 (18)
Q314 OFF
D310 OFF
Q315 ON
Q324
Q4 (19)
Q316 OFF
D313 OFF
R335
Q3 OFF
R15
Q326
D314 ON
R334
4.4V
Q310 OFF
AM + B OFF
D308 OFF
D321
OFF
(B)
Q324 (14)
Q309 OFF → D307 OFF
Q324 (5)
Q324
(C)
Q302 ON → Q301 ON → FM + B ON
(D)
(E)
Q304 → Q303
Tuning voltage
TP
(F)
(G)
Q326 FM
"last memory"
Q325
(H)

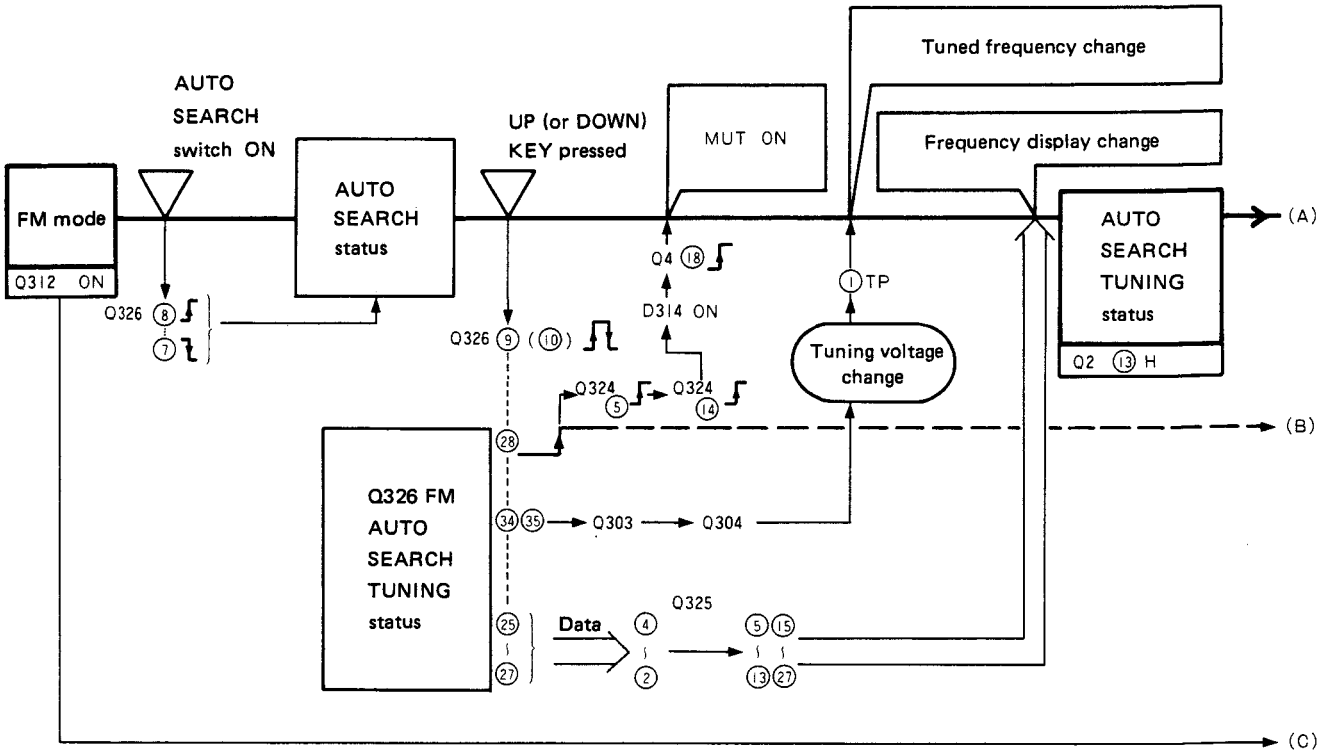
FM → AM


AM
KEY pressed
MUT ON
FM and
MHz dot
indicators
OFF
STEREO and TUNER indicators
and FM tuner
OFF
FM TUNER indicator circuit
and weak input MUT circuit
OFF
AUTO → MONO
Weak FM input
MUT killer
ON
FM mode
(I)
Q4 (18)
D314 ON
Q324
Q312 OFF
Q4 (19)
D313 ON
Q316 ON
R335
Q326
4.4V
Q302 OFF
FM + B OFF
(J)
Q324 (14)
Q301 OFF
Q324 (5)
Q324
(K)
Q310 ON → Q309 ON → D307 ON
AM + B ON
(L)
(M)
Q304 → Q303
Tuning voltage
TP
(N)
(O)
Q326 AM
"last memory"
R325
(P)

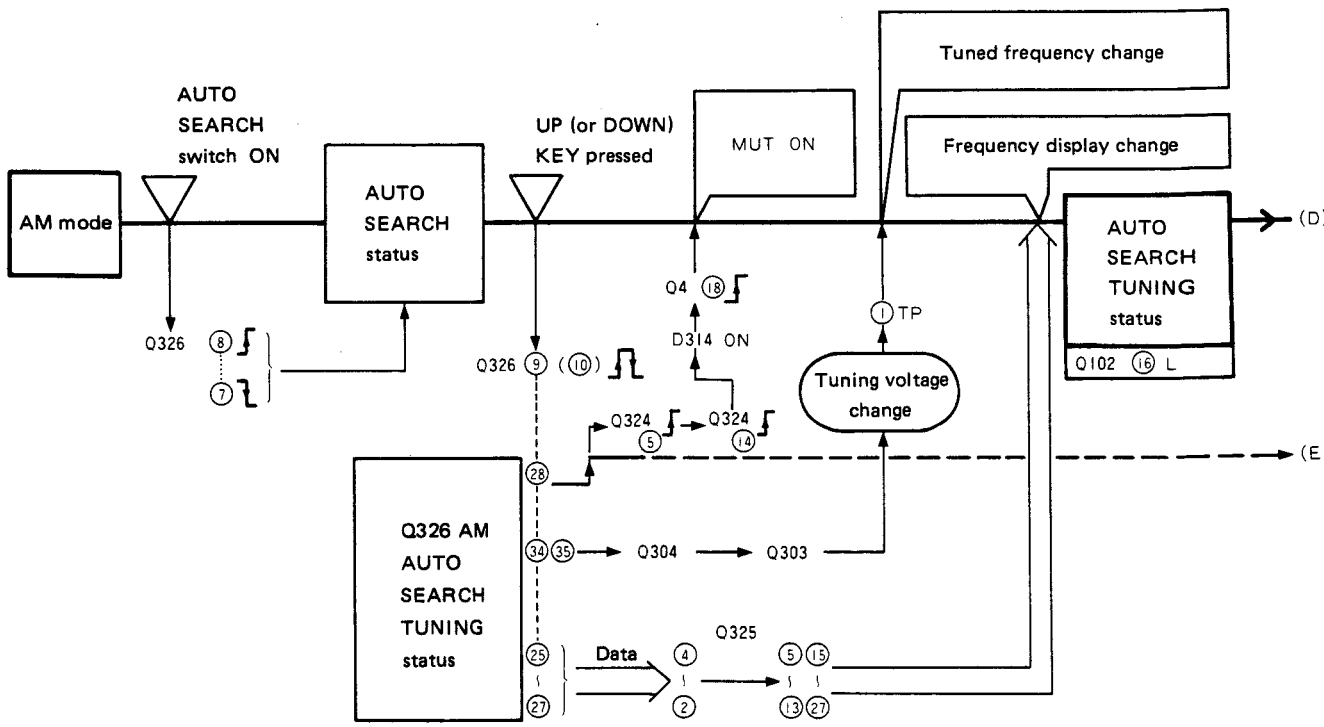

FM IF killer OFF
FM TUNED indicator circuit and weak input MUT circuit ON
FM MHz dot indicators ON
Frequency display change
TUNED IND ON
MUT OFF
FM tuner ON
FM "last memory" broadcasting station tuned
STATION CALL display change
FM mode
(A)
Q2 (15)
11.7
10.5
Q2 (13)
Q4 (18)
(B)
Q312 ON
Q313 OFF
D309 ON
Q314 ON
D312 OFF
D301 ON
D314 OFF
(C)
Q324 (14)
(D)
Q324 (5)
(E)
(28) Q326
(F)
(G)
(H)

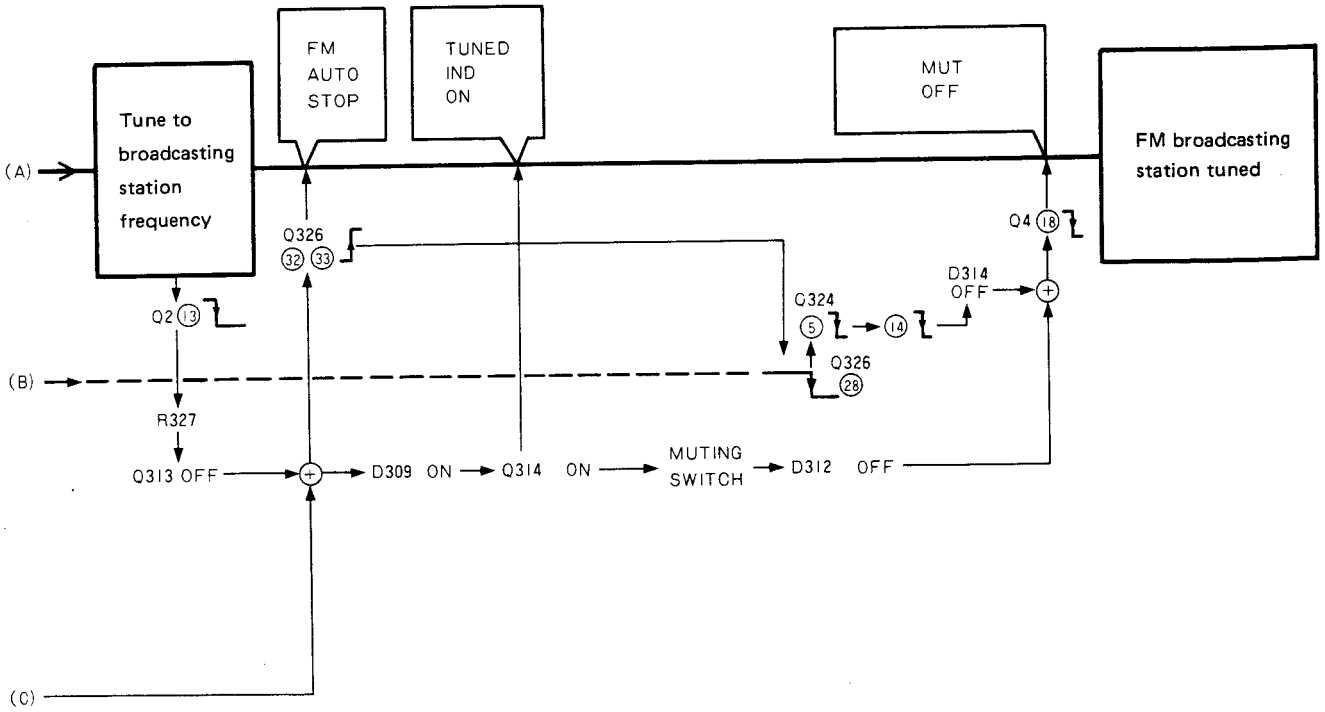

AM output switch ON
AM "last memory" broadcasting station tuned
Frequency display change
TUNED IND ON
MUT OFF
AM tuner ON
FM IF killer ON
AM and kHz indicators ON
STATION CALL display change
AM mode
(I)
Q3 ON
Q2 (15)
11.7
10.5
R15
Q102 (16)
Q314 ON
D310 ON
Q4 (18)
D314 OFF
(J)
D301 OFF
Q315 OFF
R334
(K)
Q324 (14)
(L)
D308 ON
D321 ON
Q324 (5)
(M)
Q326 (28)
(N)
(O)
(P)

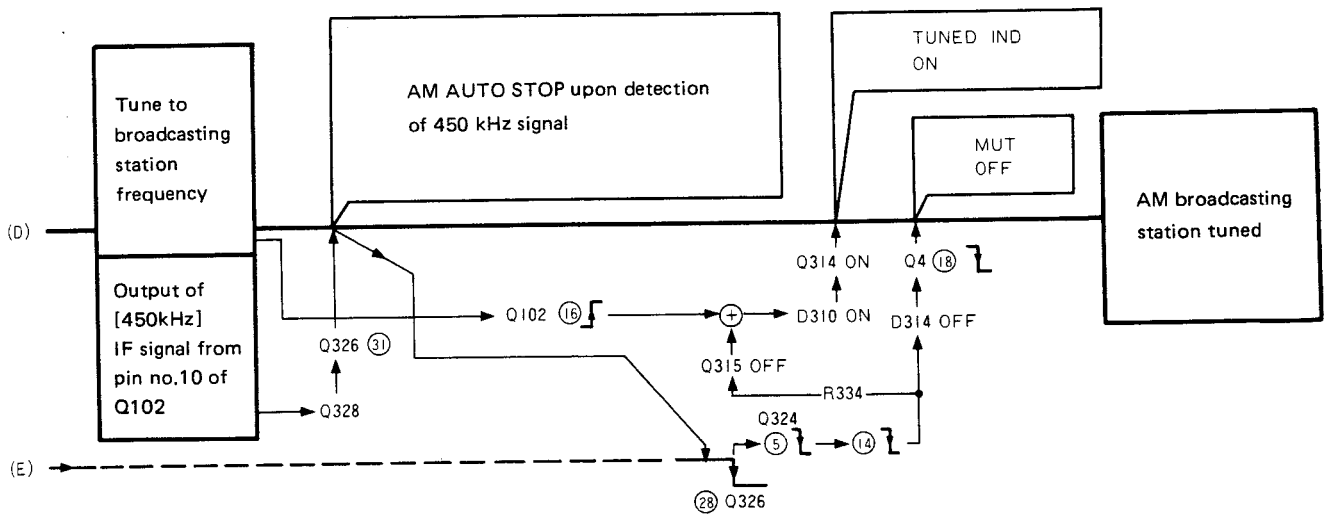
FM AUTO SEARCH TUNING Operation



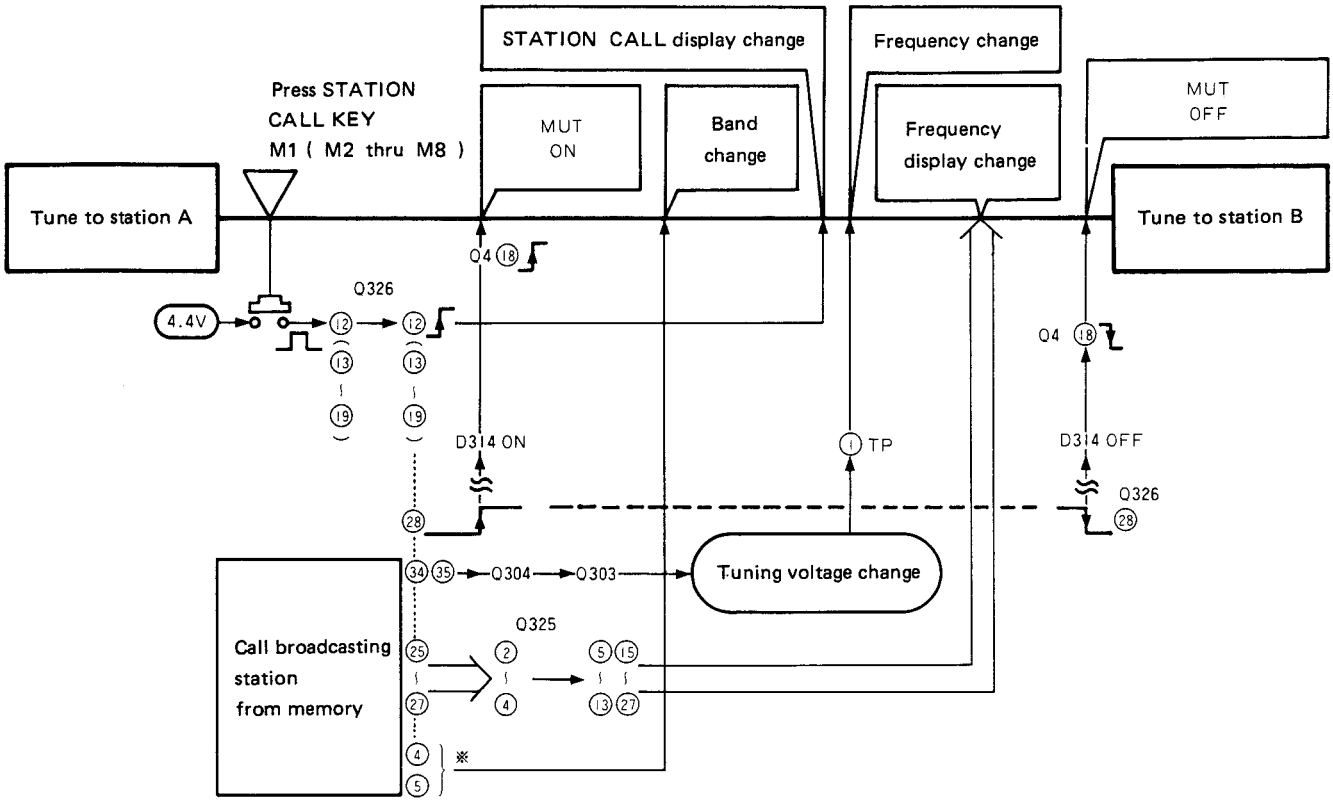
AM AUTO SEARCH TUNING Operation




(A)
Tune to broadcasting station frequency
FM AUTO STOP
TUNED IND ON
MUT OFF
FM broadcasting station tuned
Q326 (32) (33)
Q4 (18)
Q2 (13)
Q324 (5) → (14)
D314 OFF
(B)
Q326 (28)
R327
Q313 OFF
D309 ON
Q314 ON
MUTING SWITCH
D312 OFF
(C)


(D)
Tune to broadcasting station frequency
AM AUTO STOP upon detection of 450 kHz signal
TUNED IND ON
MUT OFF
AM broadcasting station tuned
Output of [450kHz] IF signal from pin no.10 of Q102
Q314 ON
Q4 (18)
Q102 (16)
D310 ON
D314 OFF
Q326 (31)
Q315 OFF
R334
Q328
Q324 (5) → (14)
(E)
(28) Q326

STATION CALL Operation



Memory Operation